

REMARKS

In the Office Action, the Examiner rejected claims 1-38. By the present Response, Applicants amend claims 1, 11, 19, 29, and 34 to clarify certain aspects of the claim recitations. These amendments do not add any new matter and are fully supported by the specification. Upon entry of the amendments, claims 1-38 will remain pending in the present patent application. Reconsideration and allowance of all pending claims are requested.

Rejections Under 35 U.S.C. § 102

In the Office Action, the Examiner rejected claims 1-6, 9-14, 17-20, 23-25, 27, and 28 under 35 U.S.C. § 102(b) as being anticipated by Engel et al. (U.S. Patent No. 3,852,642). The Examiner also rejected claims 34 and 37 under 35 U.S.C. § 102(b) as being anticipated by Morron et al. (U.S. Patent No. 6,025,980). Applicants respectfully traverse these rejections.

A *prima facie* case of anticipation under 35 U.S.C. § 102 requires a showing that each limitation of a claim is found in a single reference, practice or device. *In re Donohue*, 226 U.S.P.Q. 619, 621 (Fed. Cir. 1985). Accordingly, Applicants need only point to a single element not found in the cited reference to demonstrate that the cited reference fails to anticipate the claimed subject matter. The prior art reference also must show the *identical* invention “*in as complete detail as contained in the ... claim*” to support a *prima facie* case of anticipation. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989).

Addressing first the rejection based on the Engel et al. reference, Applicants note that independent claims 1, 11, and 19 each contain recitations not disclosed by the cited reference. For instance, the Engel et al. reference fails to disclose a “leakage current suppression circuit configured to . . . conduct leakage current” as recited in amended claims 1 and 11. Similarly, claim 19 has been amended for consistency with claim 1 and

now recites a “leakage current suppression circuit being operative to conduct leakage current.” Before the present amendments, the Examiner referred to operational amplifier 24 of the cited reference as equivalent to a “leakage current suppression circuit.” Upon careful review of the Engel et al. reference, Applicants respectfully submit that such a contention is untenable. However, Applicants have amended claims 1, 11, and 19 to further clarify certain aspects of the present techniques.

As would be appreciated by one skilled in the art, the Engel et al. reference is directed to an improved ground fault interrupter apparatus. Col. 1, lines 45-48. The apparatus of Engel employs a differential transformer 10 comprising a toroidal core 12. Col. 2, lines 46-52. Conductors L and N extend through the core as primary windings. *Id.* Sensing winding 14 is provided about core 12 “for *sensing an imbalance in the conduction current levels* of the primary conductors L and N that indicates the occurrence of a *ground fault*” (emphasis added). Col. 2, lines 54-58. Sensing coil 14 is connected to a trip circuit 16. Col. 2, lines 58-61. This trip circuit 16 is responsive to the level of sensed voltage on coil 14 and may actuate a circuit breaker 18 on the line conductor via solenoid coil 20 “to open the circuit *upon the occurrence of a predetermined current imbalance between conductors L and N*” (emphasis added). Col. 2, lines 61-67. Again, as noted above, the reference teaches that such a current imbalance is indicative of a ground fault.

It should be clarified that the cited reference uses the term “leakage current” to denote current *leaving the conductors L and N through a ground fault*. Col. 1, lines 33-41. The reference also compares types of leakage currents, distinguishing between inherent capacitive leakages to ground and resistive leakage currents to ground that may be caused by a person shorting the circuit to ground. *Id.* This latter class of leakage currents pose an electrocution risk, hence the need for a ground fault interrupter. Thus, the term “leakage current” in the cited reference refers to current that is *leaking out of the conduction circuit* to ground.

Conversely, the present application discloses a circuit for suppressing unintentional current that may be present in the control circuit. Page 6, lines 24-25. Accordingly, in the present disclosure, leakage current refers to this *unintentional current present in the control circuit*. Applicants also note that the background portion of the present disclosure clearly supports this meaning, reciting a particular need for circuitry that “can suppress leakage current *in* relay circuits.” Page 2, lines 3-5. Accordingly, the present techniques employ a leakage current suppression circuit to prevent this unintentional current entering the control circuit from energizing the relay operator. Page 6, line 24 – page 7, line 6.

In view of the discussion provided immediately above, it is clear that neither operational amplifier 24, nor the circuit comprising the amplifier, can disclose a “leakage current suppression circuit” as recited in claims 1, 11, and 19, when read in light of the specification, as no leakage current is present in the circuit comprising amplifier 24. Thus, the Engel et al. reference fails to teach such an element and, thus, cannot anticipate these independent claims.

Further, as noted above, the circuit comprising operational amplifier 24 of the Engel et al. reference is specifically designed to receive an *intentional sensed input current* upon a current misbalance between conductors L and N. As is evident from the above discussion, this intentional current input to operational amplifier 24 cannot be compared to a leakage current as understood by and used in the present disclosure. Thus, even assuming for the sake of argument that operational amplifier 24 could somehow be reasonably equated with a “leakage current suppression circuit,” the cited structure of the Engel et al. reference does not teach a “leakage current suppression circuit configured to . . . conduct leakage current” as recited in claims 1 and 11. The reference similarly fails to disclose “leakage current suppression circuit being operative to conduct leakage current” as recited in claim 19.

Further still, independent claim 1 also recites “a leakage current suppression circuit configured to be coupled electrically in parallel with the relay operator.” Independent claims 11 and 19 also contain similar recitations. The Examiner points to solenoid coil 20 of the Engel et al. reference as a relay operator. However, as is clear from Figure 2 of the reference and the accompanying description, current passes from conductor L, through solenoid coil 20, and then to remaining electrical components *in series with* solenoid coil 20. No electrical component of the Engel et al. reference is in parallel with the solenoid coil, thus the reference fails to disclose “a leakage current suppression circuit configured to be coupled electrically *in parallel with* the relay operator” (emphasis added).

Consequently, because the cited reference fails to disclose each and every element of the present claim, Applicants respectfully submit that independent claims 1, 11, and 19 are allowable over the Engel et al. reference. Furthermore, each of claims 2-6, 9, 10, 12-14, 17, 18, 20, 23-25, 27, and 28 depends from one of independent claims 1, 11, and 19. As a result, these dependent claims are believed to be allowable based not only on their dependency from an allowable base claim, but also for the subject matter recited in each dependent claim. Accordingly, Applicants respectfully request withdrawal of the Examiner’s rejection and allowance of claims 1-6, 9-14, 17-20, 23-25, 27, and 28.

Turning now to the rejection of claims 34 and 37 on the basis of the Morron et al. reference, the rejection is unsupported by the cited reference for reasons similar to that provided above with respect to the use and understanding of the term “leakage current” in the Engel et al. reference. Claim 34, as amended, recites “controlling a conductive state of a solid state switch in series with a relay coil such that the relay coil is energized if a current level of an input control signal is above a predetermined *input leakage current threshold level*” (emphasis added). Similar to the Engel et al. reference, the Morron et al. reference also discloses an apparatus for earth leakage protection. Col. 1, lines 42-48. The Morron et al. reference teaches an operational amplifier 52 with resistors R_{min} and

R_{max} that define current thresholds “directly related to the value of earth leakage current at which the associated protective relay (not shown) is set to trip.” Col. 3, lines 50-61. Because this reference is directed to detecting current leaking *out of a circuit*, with thresholds based on this output leakage, the Morron et al. reference does not, and cannot, disclose “controlling a conductive state of a solid state switch in series with a relay coil such that the relay coil is energized if a current level of an input control signal is above a predetermined *input leakage current threshold level*” (emphasis added) as recited by the instant claim.

Consequently, the Morron et al. reference fails to support a *prima facie* case of anticipation of claim 34. Claim 37 depends from claim 34 and is, therefore, also believed allowable over the cited reference by virtue of its dependency from an allowable base claim in addition to the subject matter it recites. Accordingly, Applicants respectfully request withdrawal of the Examiner’s rejection of claims 34 and 37.

Rejections Under 35 U.S.C. § 103

In the Office Action, the Examiner rejected claims 7, 8, 15, 16, and 26 under 35 U.S.C. § 103(a) as being unpatentable over Engel et al. in view of Misencik (U.S. Patent No. 5,541,800). The Examiner also rejected claims 35 and 36 under 35 U.S.C. § 103(a) as being unpatentable over Morron in view of Engel et al. Further, the Examiner rejected claims 29, 30, 32, and 33 under 35 U.S.C. § 103(a) as being unpatentable over Gernhardt et al. (U.S. Patent No. 5,864,455) in view of Engel et al. and claim 31 under 35 U.S.C. § 103(a) as being unpatentable over Gernhardt et al. in view of Engel et al. and Misencik (U.S. Patent No. 5,541,800). Still further, the Examiner also rejected claims 21 and 22 under 35 U.S.C. § 103(a) as being unpatentable over Engel et al. in view of Gernhardt et al. Applicants respectfully traverse these rejections.

The burden of establishing a *prima facie* case of obviousness falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination. *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984). Accordingly, to establish a *prima facie* case, the Examiner must not only show that the combination includes *all* of the claimed elements, but also a convincing line of reason as to why one of ordinary skill in the art would have found the claimed invention to have been obvious in light of the teachings of the references. *Ex parte Clapp*, 227 U.S.P.Q. 972 (B.P.A.I. 1985).

As discussed above, the Engel et al. and Morron et al. references fail to disclose each and every element of independent claims 1, 11, 19, and 34. Applicants note that claims 7, 8, 15, 16, 21, 22, 26, 35, 36, and 38 each depend from one of these allowable independent claims. The Gernhardt et al. and Misencik references fail to obviate the deficiencies of the Engel et al. and Morron et al. references. Consequently, because the instant references fail to disclose each element recited, these references cannot support a *prima facie* case of obviousness. As a result, claims 7, 8, 15, 16, 21, 22, 26, 35, 36, and 38 are allowable on the basis of their dependency from one of allowable independent claims 1, 11, 19, or 34, as well as by virtue of the subject matter separately recited in the dependent claims. Accordingly, Applicants respectfully request withdrawal of the Examiner's rejection and allowance of these dependent claims.

Turning finally to amended independent claim 29, a "leakage current suppression circuit . . . coupled electrically *in parallel with the solid state switch and the relay operator*" (emphasis added) is recited. Claim 29 also recites "the leakage current suppression circuit being operative *to conduct leakage current*" (emphasis added). The Examiner has conceded that the Gernhardt et al. reference fails to disclose a leakage current suppression circuit. *See* Office Action of September 10,

2004, page 6, lines 9-17. The Examiner relies on the Engel et al. reference to provide this element. However, as discussed above with respect to claims 1, 11, and 19, the Engel et al. reference fails to disclose a “leakage current suppression circuit” as recited by the claims.

As discussed above, the “leakage current” of the Engel et al. reference describes current leaking out of a non-control circuit to ground. The current fed to operational amplifier 24 of the reference *is not leakage current*; it is intentionally introduced into the circuit to allow detection of a ground fault and to activate circuit breaker 18. *See* col. 2, lines 54-67; col. 3, lines 31-60. Thus, even assuming that it suppresses this intentional current, the circuit comprising amplifier 24 cannot be equated with a “leakage current suppression circuit” as recited in claim 29. Further, because the current introduced into the circuit comprising amplifier 24 is not leakage current, the circuit cannot represent a “leakage current suppression circuit being operative *to conduct leakage current*” (emphasis added) as recited by the instant claim. Additionally, as also discussed above, the circuit comprising amplifier 24 of the Engel et al. reference is *in series with* the solenoid coil 20, and thus is not a leakage current suppression circuit “coupled electrically in parallel with the solid state switch and the relay operator,” as also recited by claim 29.

Because the cited references fail to disclose each and every recitation of the present claim, independent claim 29 is allowable over the Gernhardt et al. and Engel et al. references. Further, claims 30-33 depend from independent claim 29. These claims, therefore, are allowable over the cited references not only for their dependency from an allowable base claim, but also for the subject matter separately recited by these claims. Accordingly, Applicants respectfully request withdrawal of the Examiner’s rejection and allowance of claims 29-33.

Conclusion

In view of the remarks and amendments set forth above, Applicants respectfully request allowance of the pending claims. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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